

Abstract of the Disclosure

MIXED MODE FUEL INJECTOR AND INJECTION SYSTEM

A fuel injector includes a homogenous charge nozzle outlet set and a conventional nozzle outlet set that are controlled respectively by first and second three way needle control valves. Each fuel injector includes first and second concentric needle valve members. One of the needle valve members moves to an open position for a homogenous charge injection event, while the other needle valve member moves to an open position for a conventional injection event. The fuel injector has the ability to operate in a homogenous charge mode with a homogenous charge spray pattern, a conventional mode with a conventional spray pattern or a mixed mode.